TRAUMA-FRAKTUR-DISLOKASI & MULTI TRAUMA

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Definisi :

- Emergency :
  - A situation that involves a potential disabling or life threatening condition, thus requiring immediate treatment intervention

- Trauma :
  - A physical wound or injury to living tissue caused by an extrinsic agent

Trauma

- Trauma occurs so commonly that it is often difficult to establish a relationship between the chief complaint and an episode of trauma.
- Children in particular are subject to all kinds of minor trauma, and the family may attribute the onset of an illness to a specific recent injury

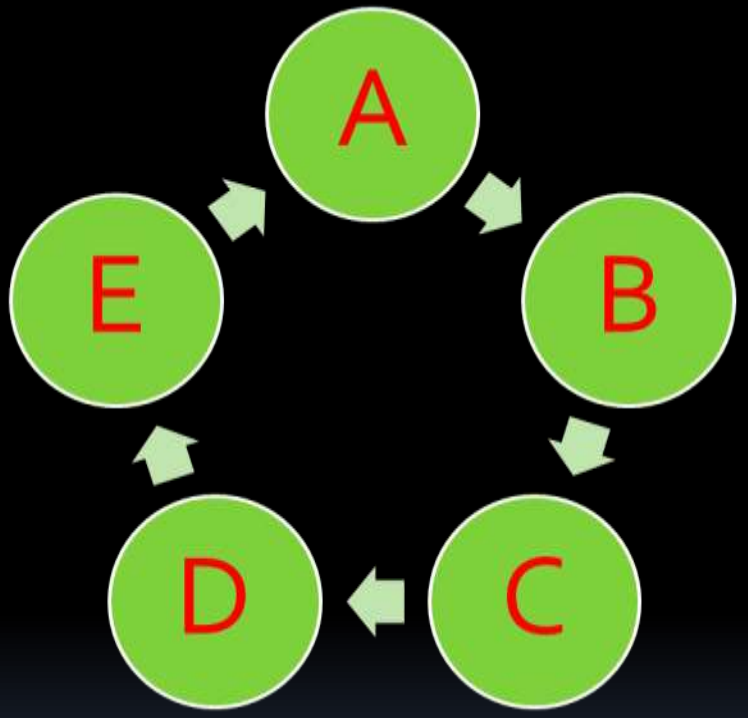
TREAT PATIENT NOT PARTIALLY BUT WHOLE AS A HUMAN

Patient with trauma

- Primary survey
- Secondary survey

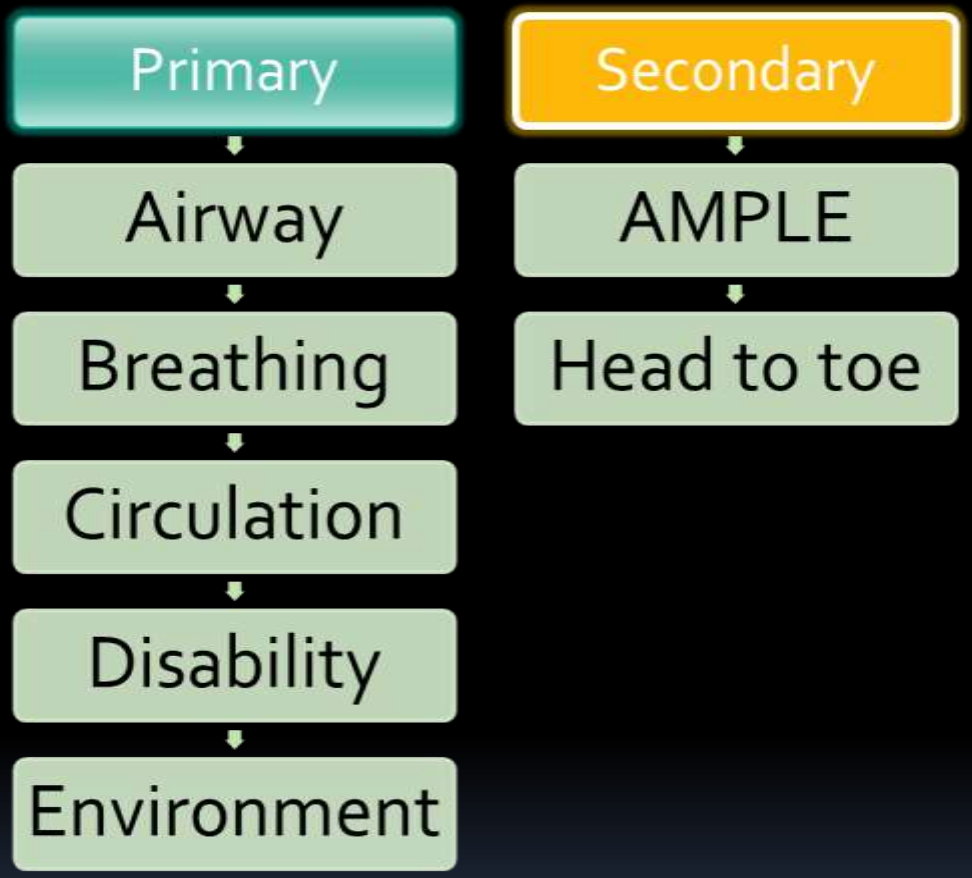
Primary survey

- Airway
- Breathing
- Circulation
- Disability
- Environment

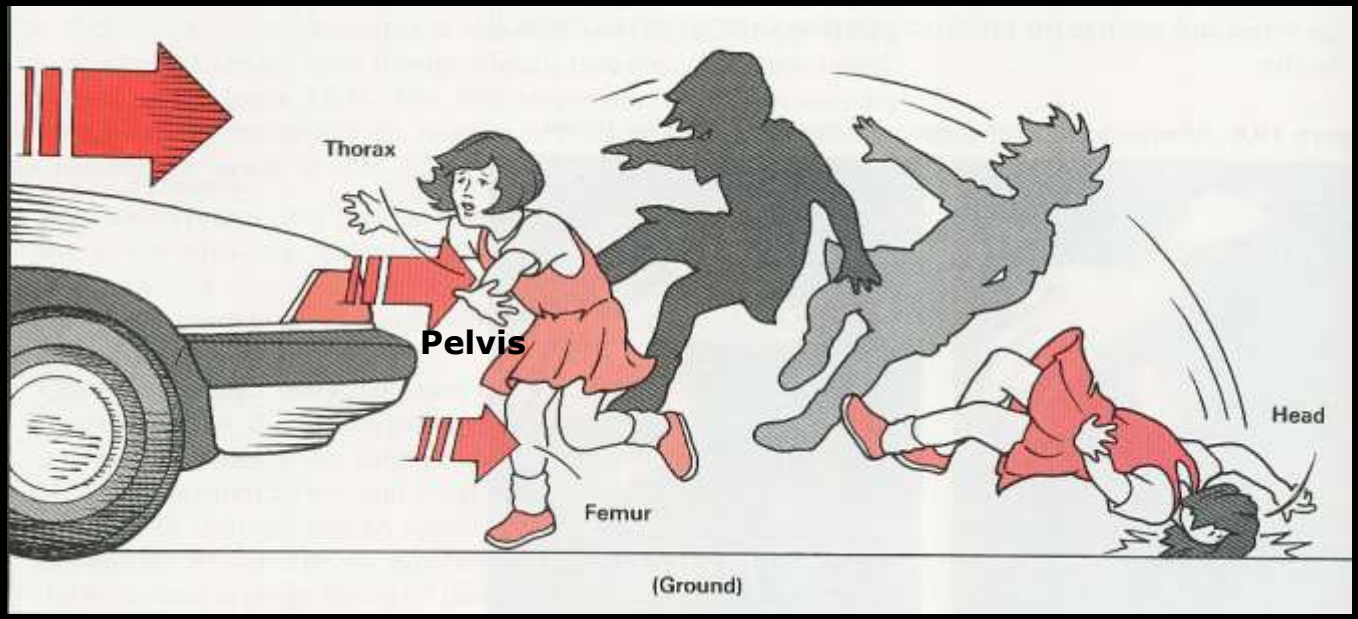


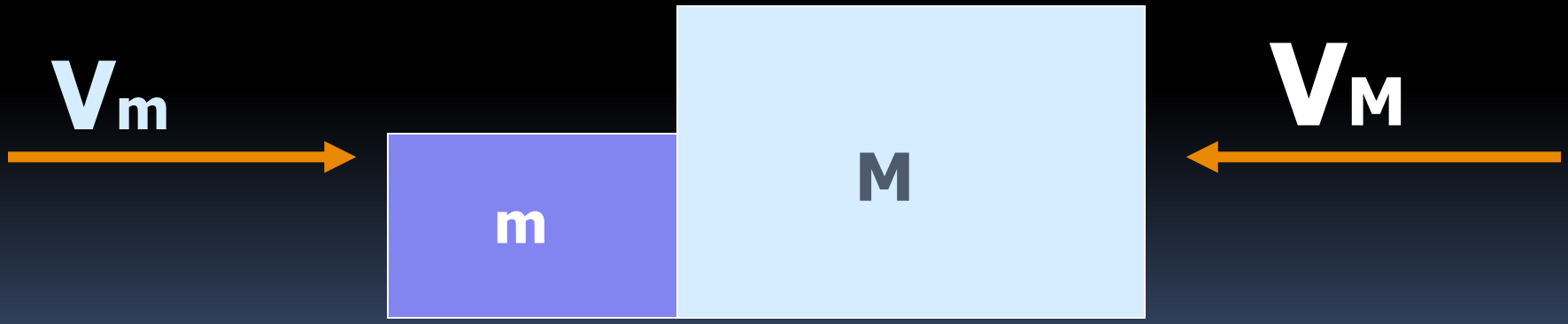
Secondary survey

- Allergie
- Medication
- Past Medical History
- Last Meal
- Event at injury


Primary
Airway
Breathing
Circulation
Disability
Environment
Secondary
AMPLE
Head to toe

Biomechanics of Fractures





$$E \text{ (Energy Kinetic)} = \tfrac{1}{2}\, MV^2$$

Assume a 155 pound (70 kilo) object traveling at 30 mph, the kinetic energy (KE) would be:

$$\text{kinetic energy} = \frac{\text{mass} \times \text{velocity}^2}{2}$$

$$\text{kinetic energy} = \frac{(155) \times (30)^2}{2}$$

$$\text{kinetic energy} = 69{,}750$$

For comparison, look at what happens with changes in mass and velocity:

	155 lb (70k)	165 lb (75k)	200 lb (90k)
30 mph	69,750	74,250	90,000
40 mph	124,000	132,000	160,000
60 mph	279,000	297,000	360,000

REAKSI TUBUH terhadap TRAUMA FISIK

1. Reaksi lokal
   a. Perdarahan
   b. Kerusakan jaringan → mediator
      - Histamin
      - Prostaglandin
      - Bradikinin
      - Leukotrin
      - Enzym proteolytic

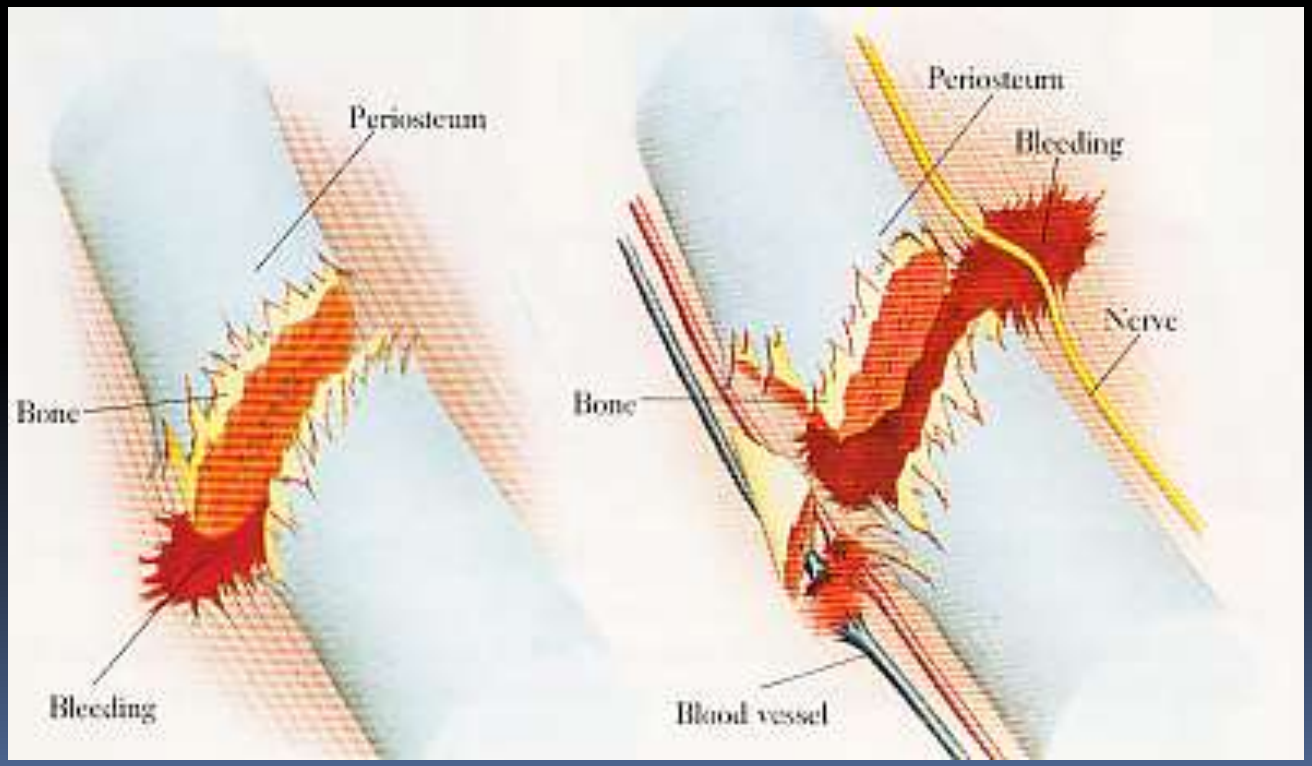
   Inflamasi

   a & b → Bengkak → RICE (48 jam I)

2. Reaksi Umum : SIRS

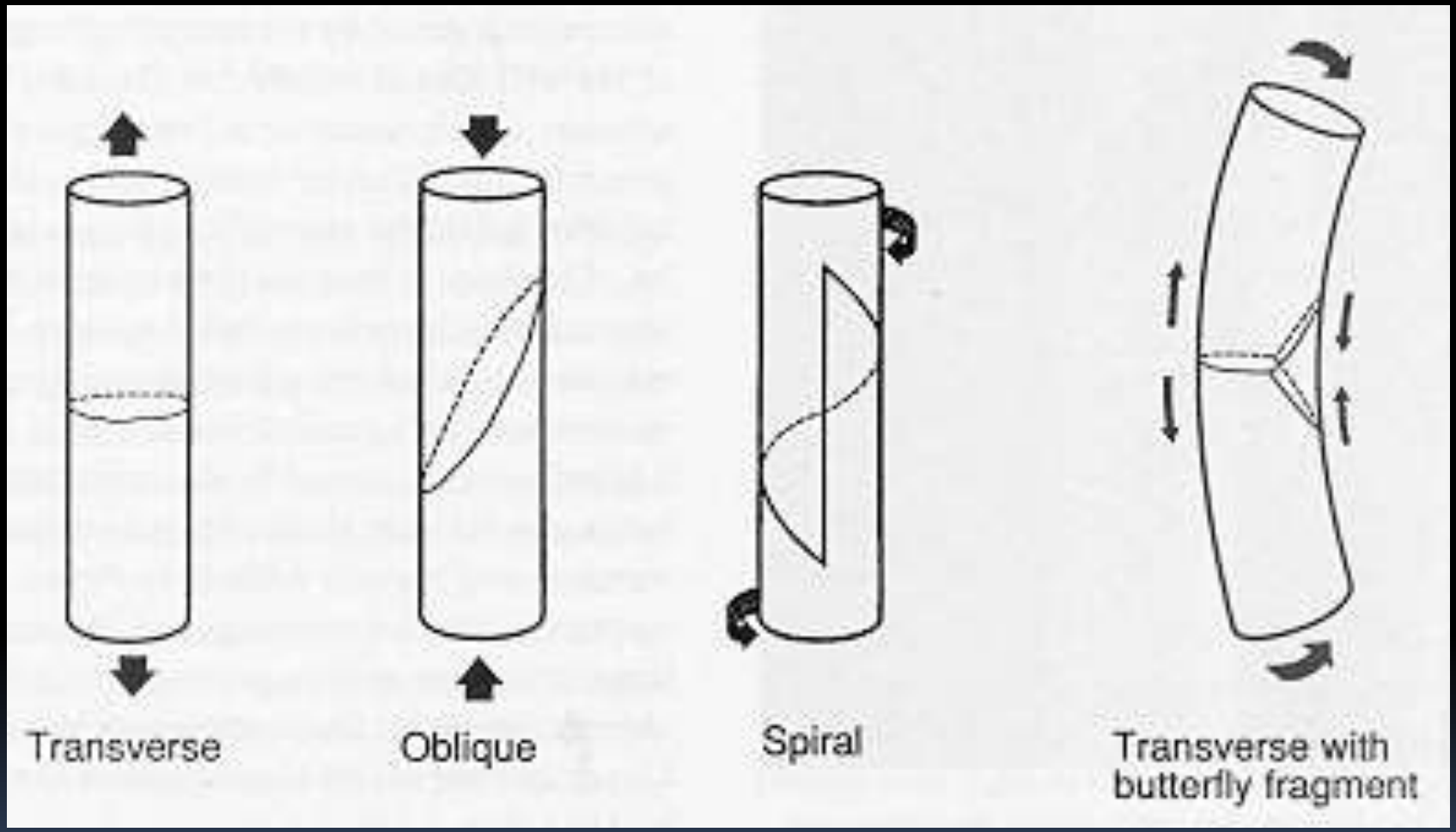
FRACTURE (PATAH TULANG)

- DISKONTINUITAS KORTEK TULANG & ATAU TULANG RAWAN

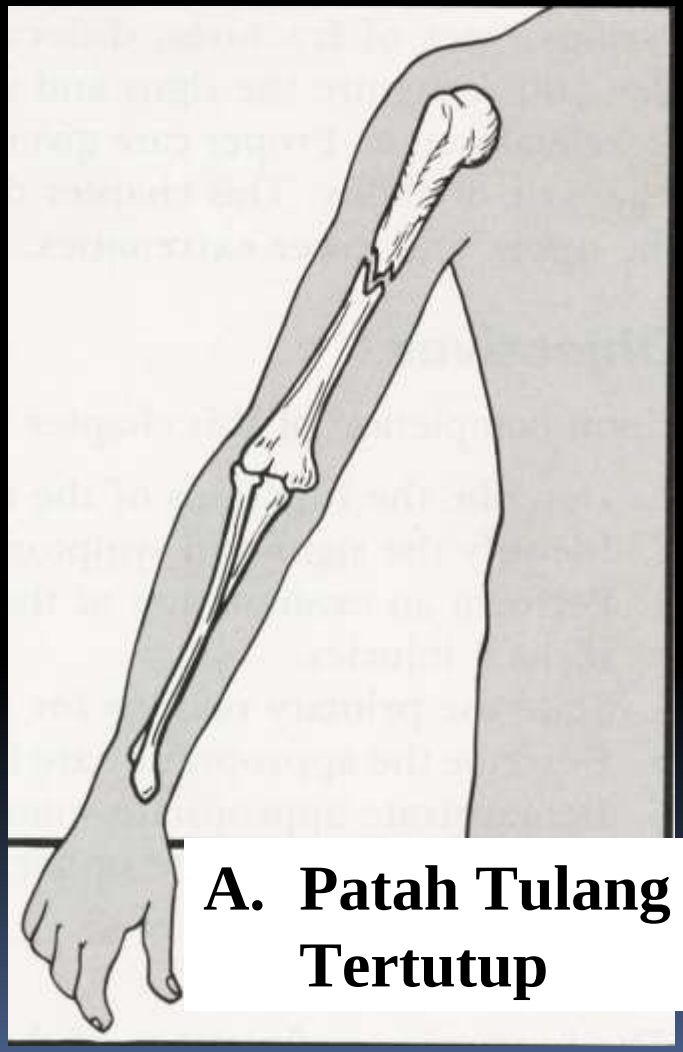


PEMBAGIAN/JENIS FRAKTUR

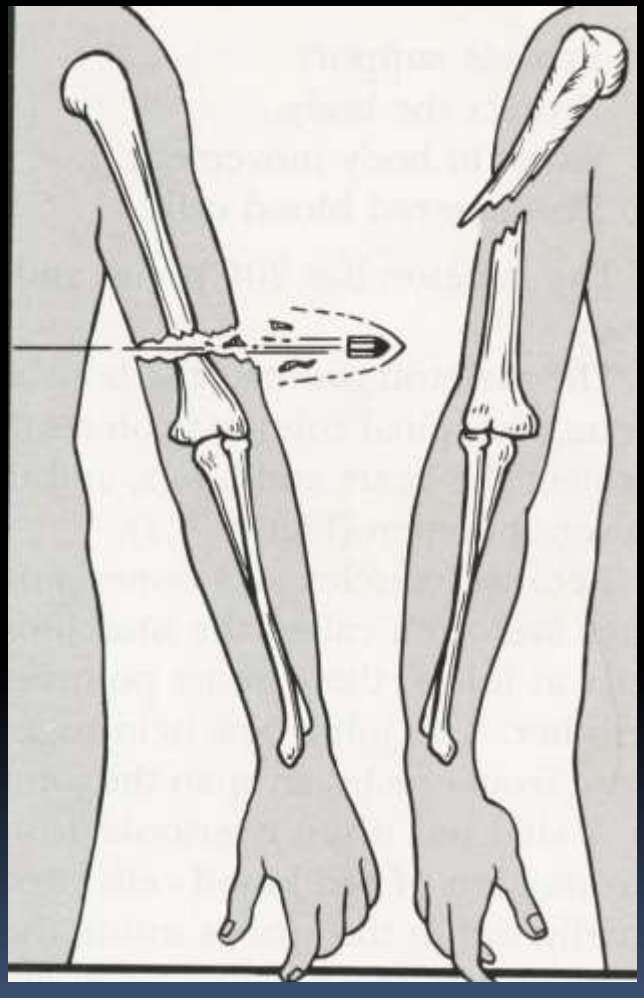
- Garis fraktur
  - Simple-transverse-multiple
  - Komunitif-segmental
  - Oblique-spiral
  - Complete-incomplete
- Hubungan dengan luar :
  - terbuka-tertutup
- Anak-anak :
  - Green stick
  - epiphysiolysis
- Tarikan otot/ligament :
  - Avulsi


Transverse
Oblique
Spiral
Transverse with
butterfly fragment

Jenis Patah Tulang



A. Patah Tulang Tertutup



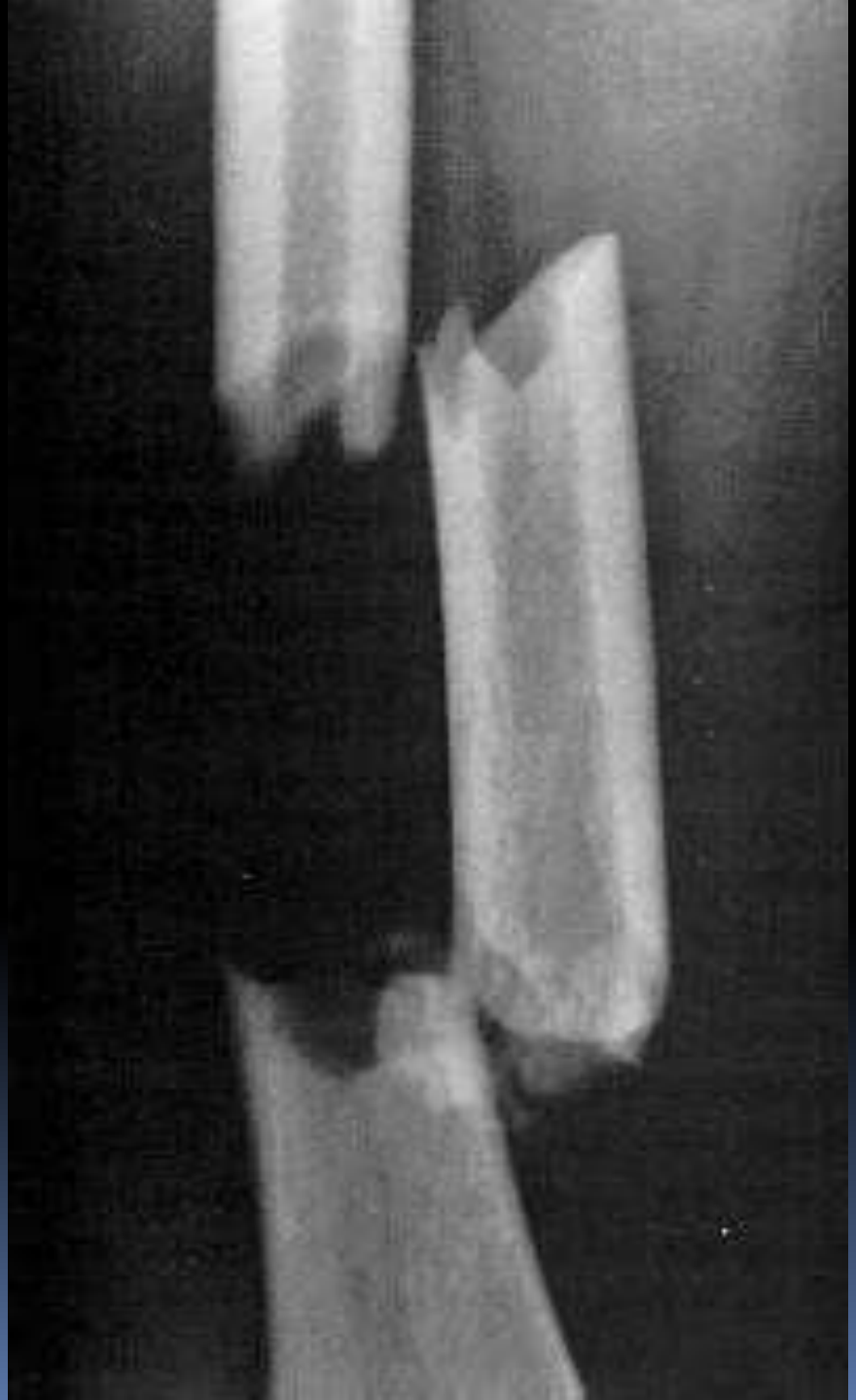
B. Patah Tulang Terbuka

Fracture Pada Anak-Anak

Buckle Fract.

Greenstick Fract

Epiphyseal Fract.



DIAGNOSA FRAKTUR : CLINICAL !!

1. History
   - When, How (M.O.I)
   - Can be used soon after trauma?
2. Physical diagnostic
   - Look
   - Feel
   - Move
3. Tools
   - X-ray photo
   - CT-scan
   - MRI
   - Three D CT

In doubt treat as fracture!!

MECHANISMS OF INJURY

I. How to make diagnosis?

Look

- **Deformity**
  - Discrepancy
  - Angulation
  - Rotation
- **Position**
- **Edema**
- **Appearance of the distal part**
  - Pale
  - Darken
- Open fracture :
  - Tepi perlukaan kulit tidak rata
  - Sifat perdarahan : oozing, venous & spotty fat.

I. How to make diagnosis?

- Feel
  - Crepitation → attention pain↑
  - Temperature
  - Pulse
  - Sensory

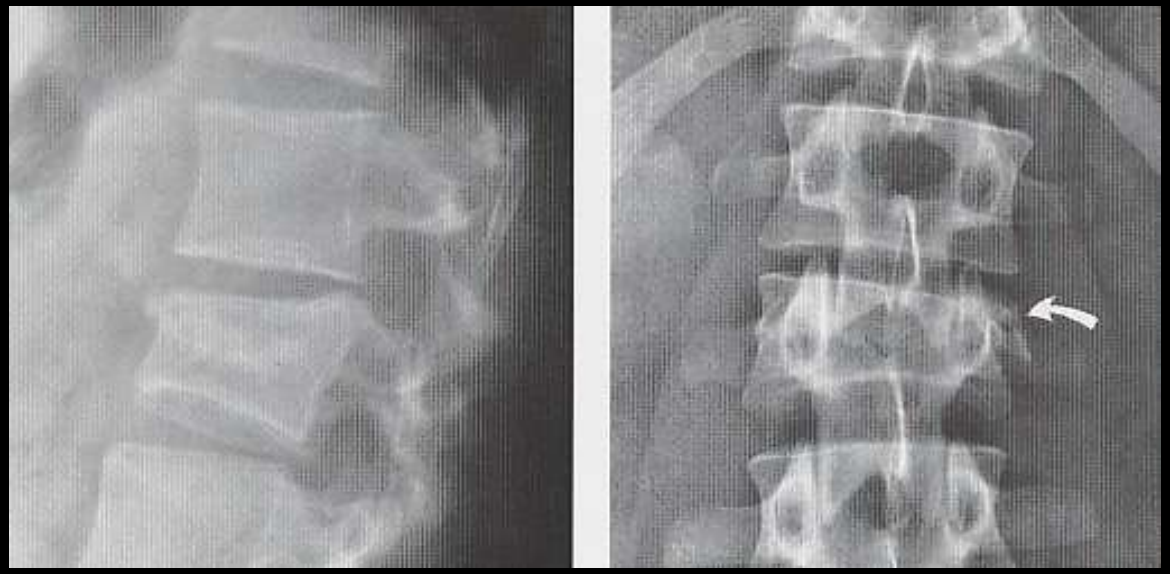
  } of the distal part
- Move
  - **Active**
  - **Passive**
  - **Power**

  } Parese -paralysis
  - **False movement → attention pain↑**
- Measurement
  - True length
  - Appearance
  - Circumferencial

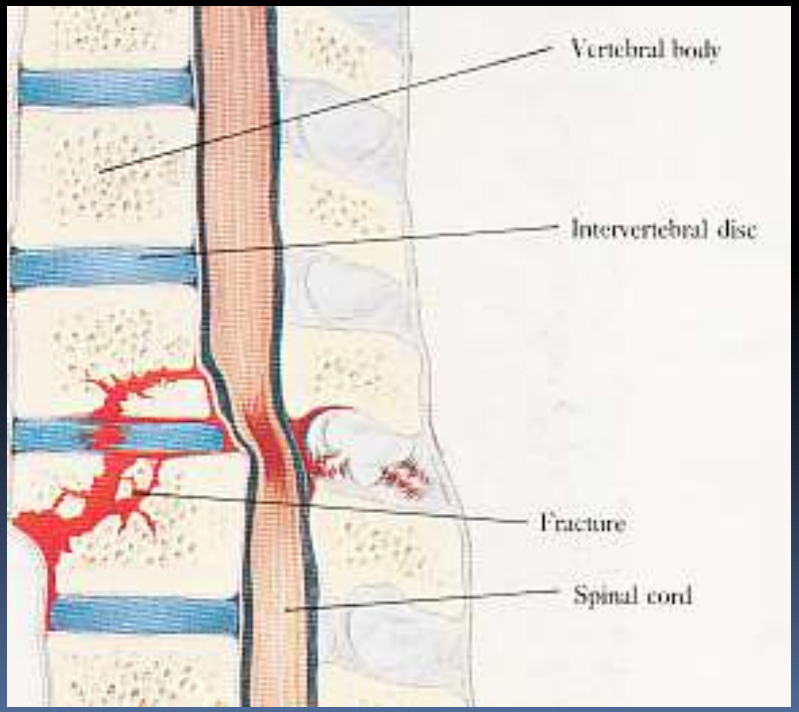
X-Ray photo :

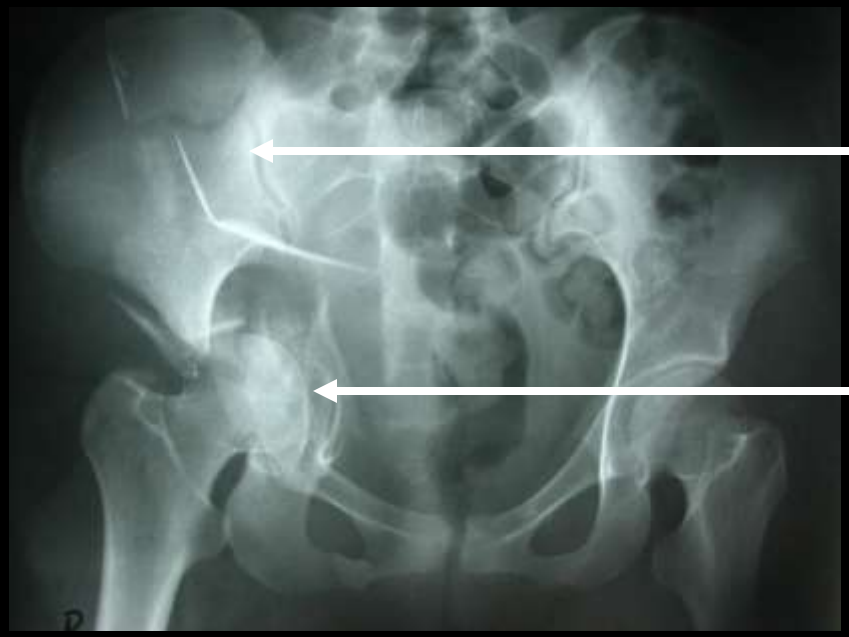
- Mencakup sendi proximal & distal tulang yang fraktur
- AP-Lat, " special order"
- Sisi normal untuk perbandingan

Lumbal Frature



CT-Scan





Illiac Wing Fract

Acetabulun Central Dislocation

CT-three D

Pengobatan patah tulang

1. Terhadap nyeri : medicamentous, immobilisasi
2. Terhadap shock : neurogenic & hypovolumic
3. Patah tulang tertutup : TRIAS
   a. reposisi
   b. fixasi imobilisasi
   c. rehabilitasi mutlak
4. Patah tulang terbuka :
   - debridement dulu (luka kontaminasi=golden periode)
   - TRIAS therapy fracture
5. Observasi/check 24 jam neuro vascular?

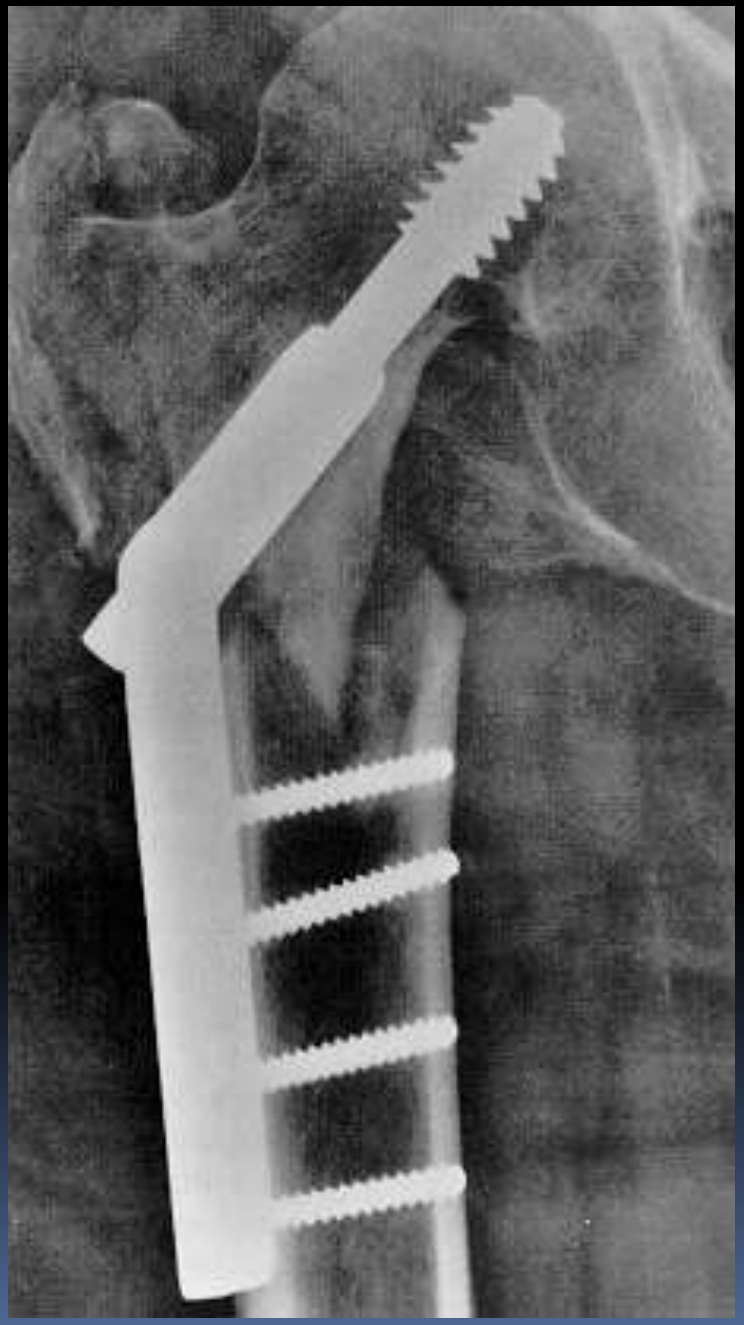
TRIAS PENGOBATAN FRAKTUR

A. Reposisi : periode tissue shock, acceptability

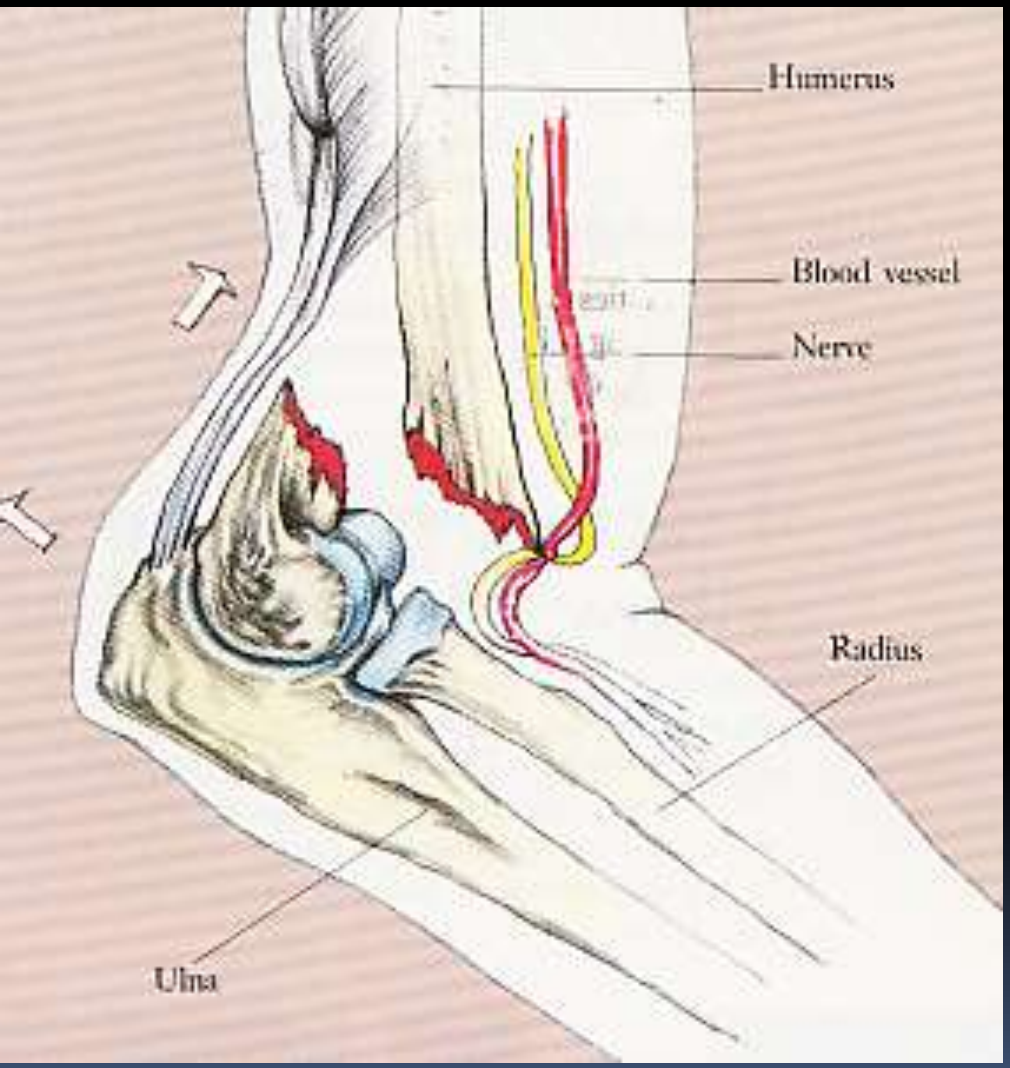
B. Fiksasi-Immobilisasi

- Casting/gips
- Traksi kontinue : Skeletal, Skin
- External : Illizarov, Wagner, INOUE, Judet, etc
- Internal : implant

C. Rehabilitasi mutlak



Komplikasi Patah Tulang



Dini :

- Pembuluh darah robek/ terjepit
  - compartment syndrome
- Syaraf/spinal cord
- Shock (neurologic & hypovolumic

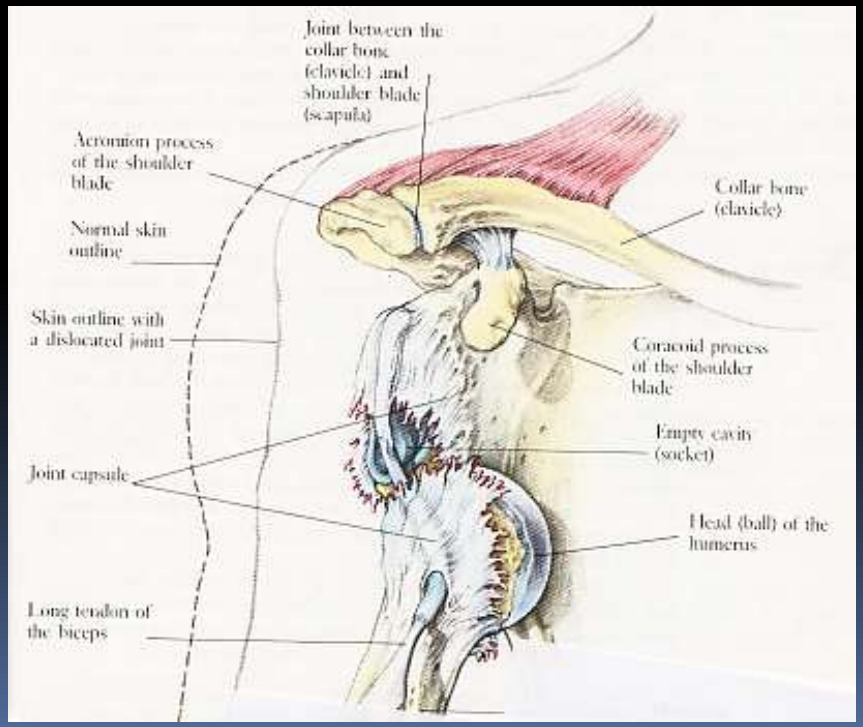
Lambat :

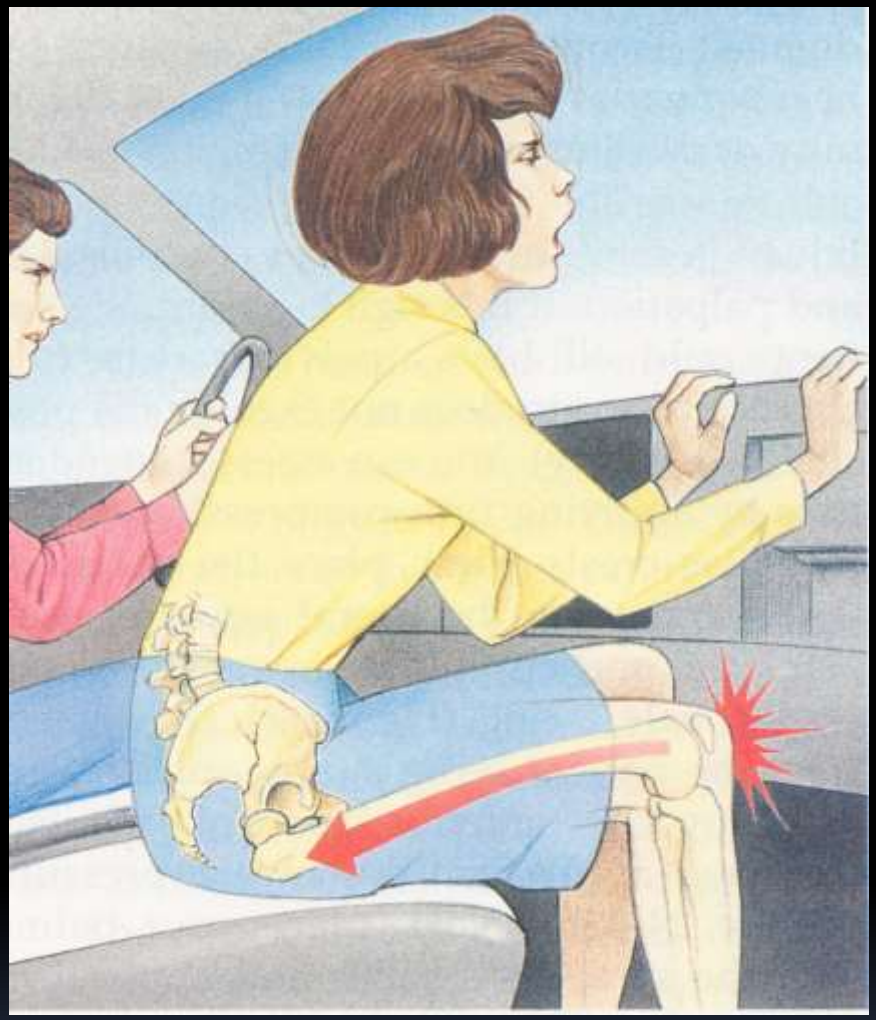
- Malunion
- Non union
- OA post fracture intraarticular

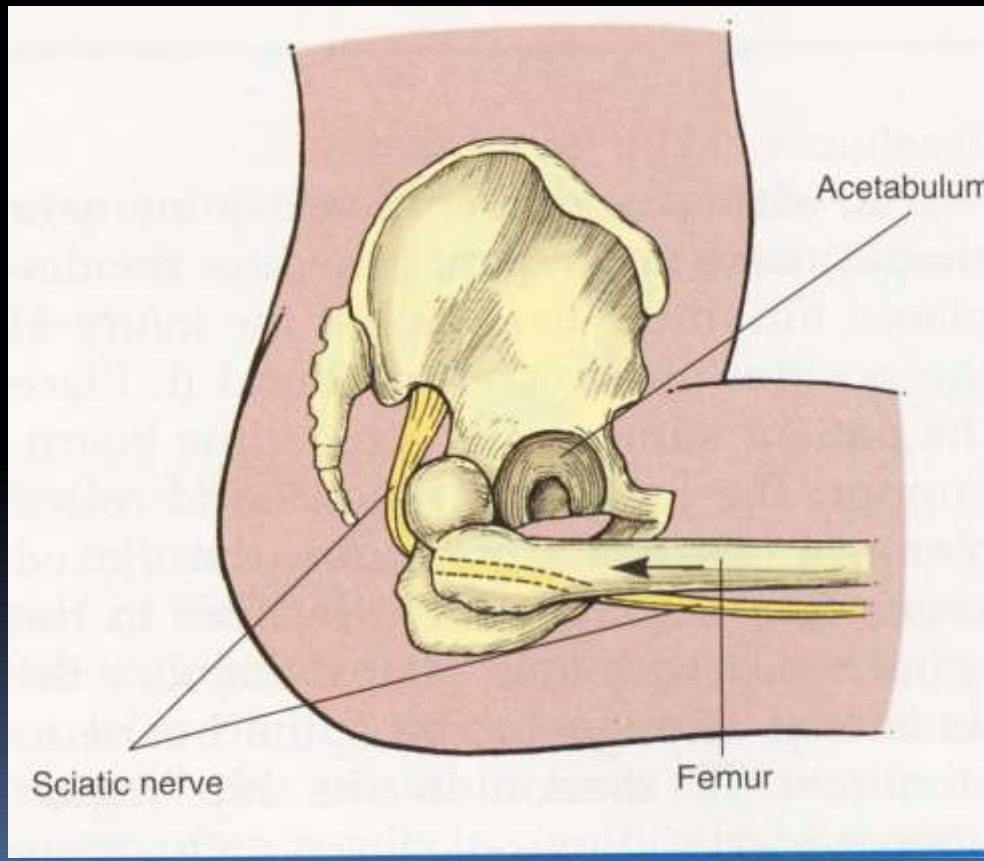
DISLOCATIONS (CERAI SENDI)

Discountinuity of joint

- At least a part of capsule and its ligaments must be torn
- Total dislocation : luxation
- Subluxation






Acetabulum
Sciatic nerve
Femur

Avascular necrosis ?

Subluxation

Cedera Tulang Belakang

Cervical Dislocation

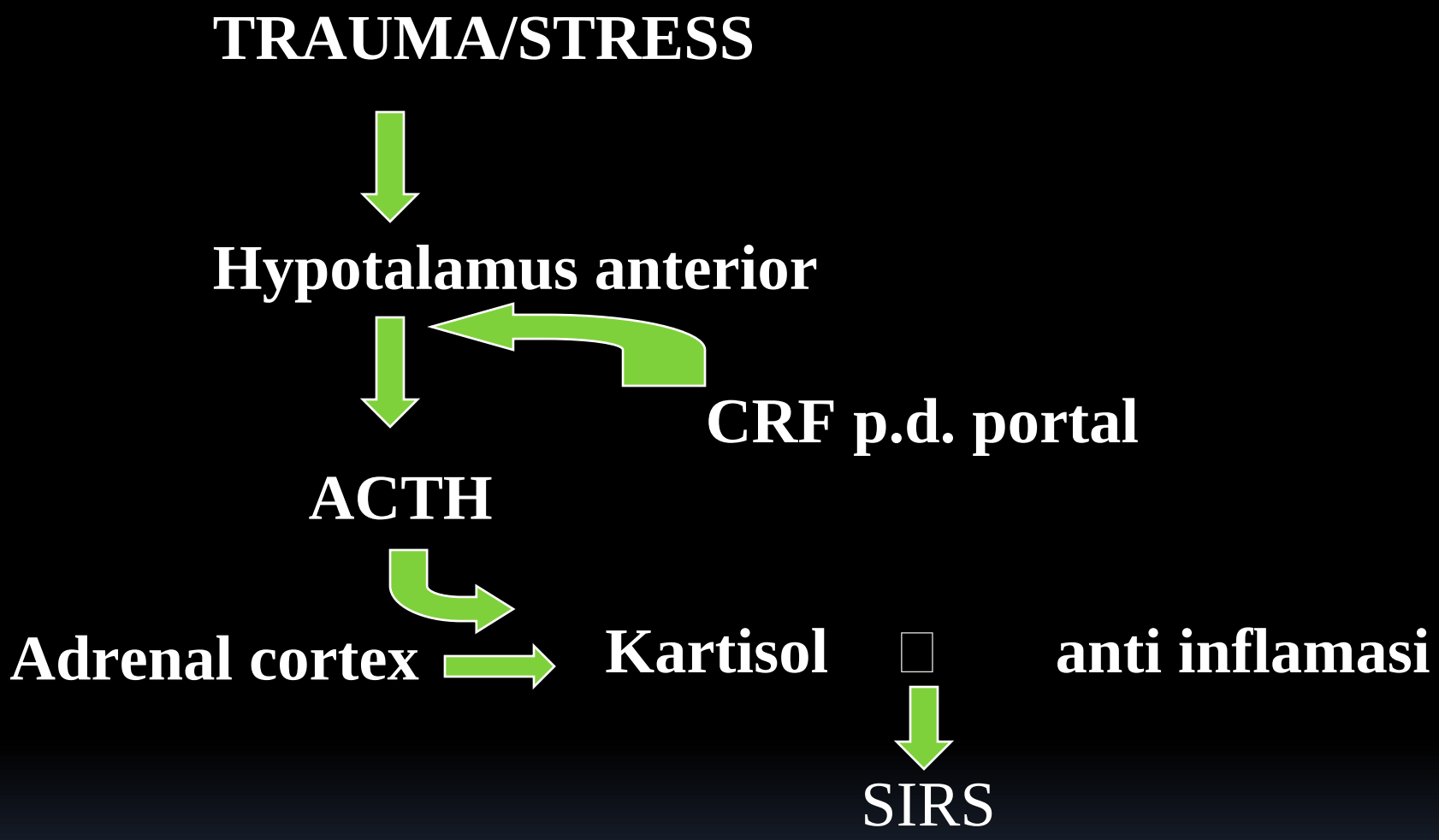
Thorax Dislocation

- Habitual Dislocation
- Recurrence dislocation
- Congenital dislocation hip

FRACTURE - DISLOCATIONS

What is Multiple Trauma ?

- **Multiple Injury Cases :**
  Trauma to the several part / structures of the body in the same moment
- **Polytrauma (AO) :**
  A syndrome of multiple injuries (ISS > 17) with sequential traumatic reactions which may lead to dysfunction or failure of remote organs and vital system
- **Multiple Significant Trauma (MST):**
  Multiple injured case who's threatening on life and disabled


TRAUMA/STRESS
Hypotalamus anterior
CRF p.d. portal
ACTH
Adrenal cortex
Kartisol
anti inflamasi
SIRS
- Sepsis
- MOF (multi organ failure)
- RDS (respiration Distress Syndrome)

Multi Trauma

I. Quick initial exam (ABBCS)

A ir way - check for obstruction

B reathing - check thoracic-abdominal excursion

B leeding- check for any major hemorrhage

C irculation - check pulse, blood-pressure skin color, moistness

S ensorium-check quality and quantity of responsiveness , check responsiveness to pain stimuli

II. Systemic physical examination check general system

III. Examination completion

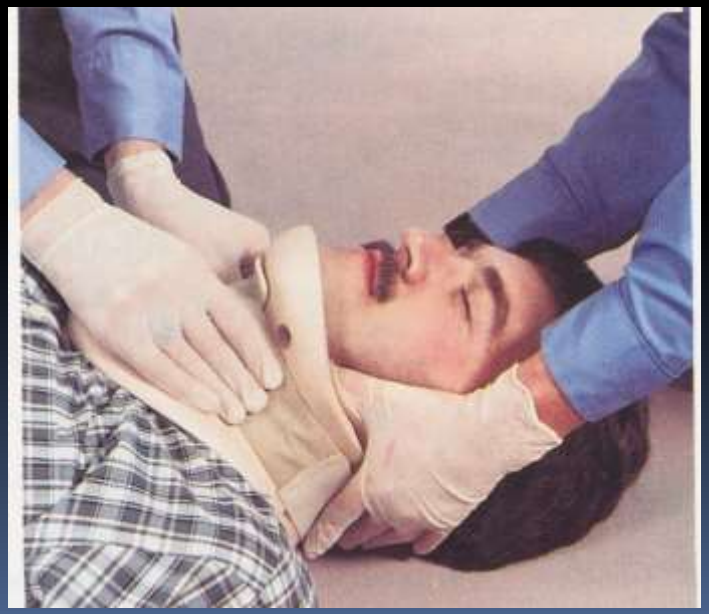
1. Life support and initial treatment
2. Priority classification (individual treatment)

2.1. Cessation of bleeding
2.2. Ventilation management
2.3. Restoration of circulation
2.4. Splinting of fractures of major bones
2.5. Treatment of shock including correction of severe endocrine and metabolic problems
2.6. Management of massive soft tissue injuries

Pre-Hospital Care

Pre-Hospital Care

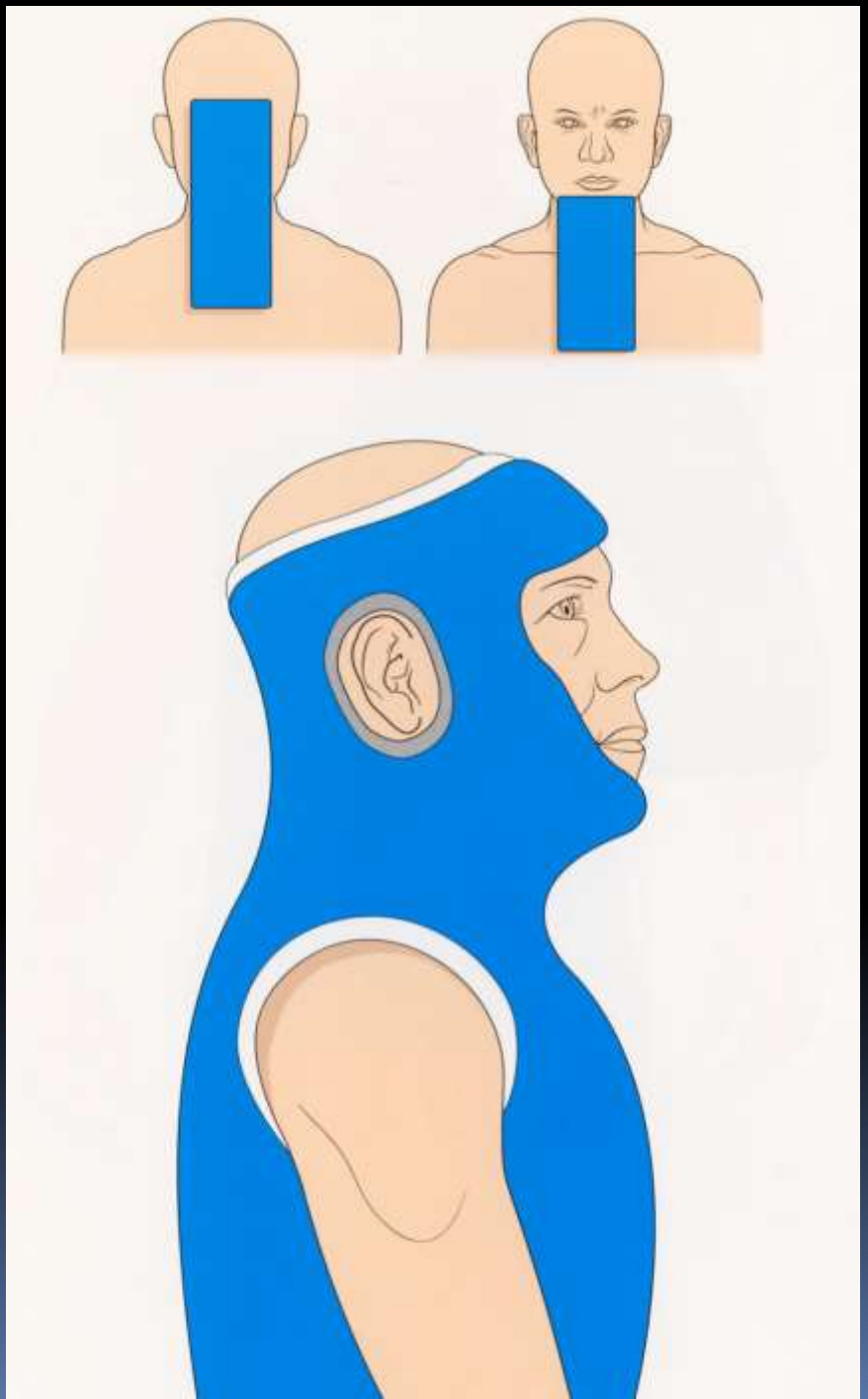
Pre-Hospital Care Fract. Cervical



Pre Hospital Care Fract. Thoraco-Lumbal

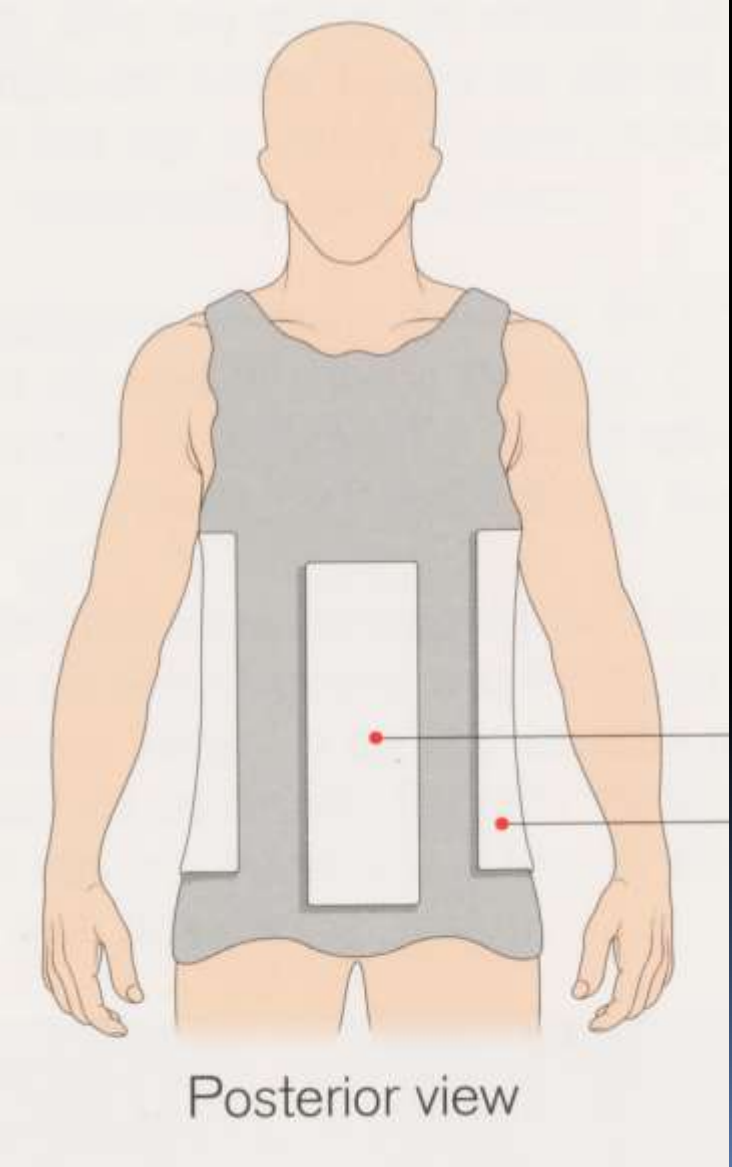
Above knee or long leg cast

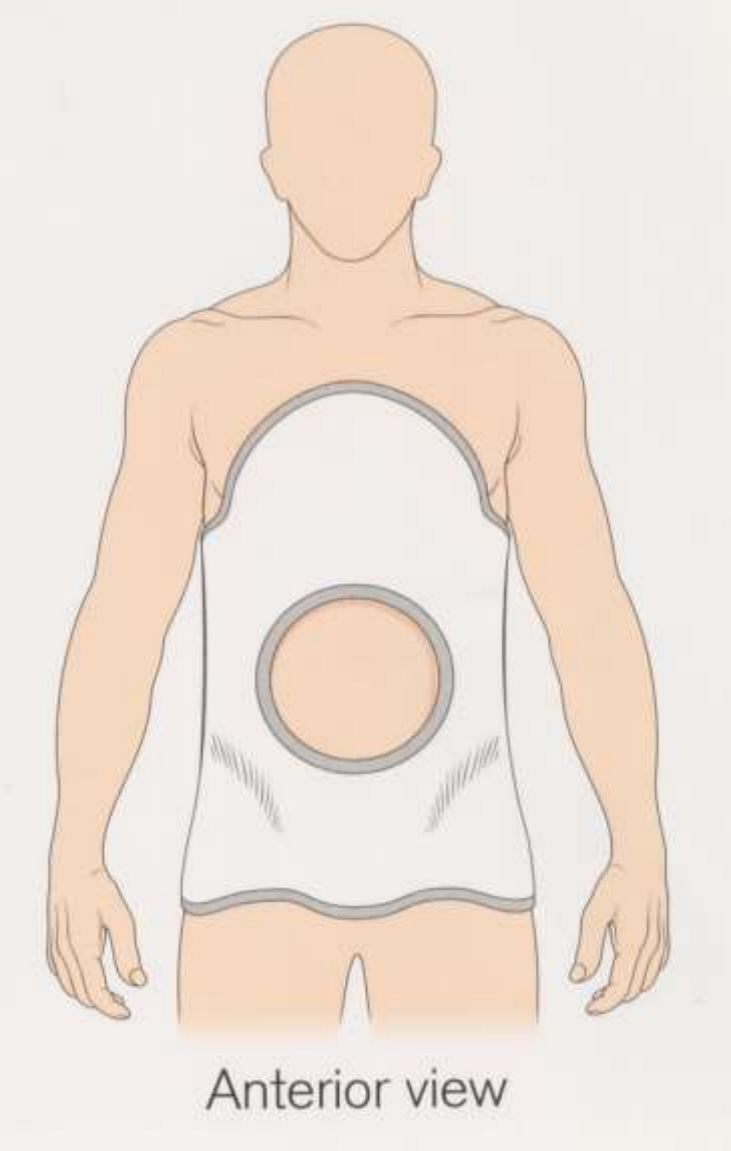
Colle’s fracture



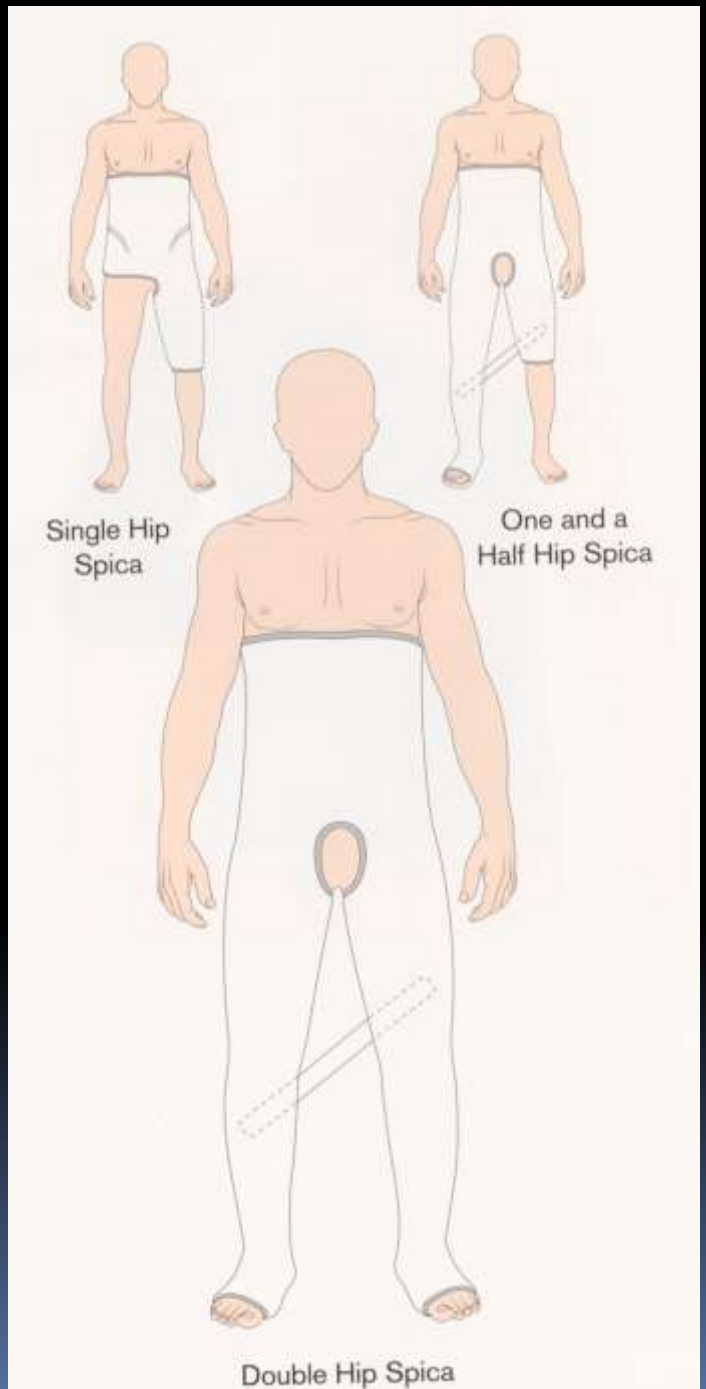
Minerva Jacket

Plaster Jacket or Body Jacket

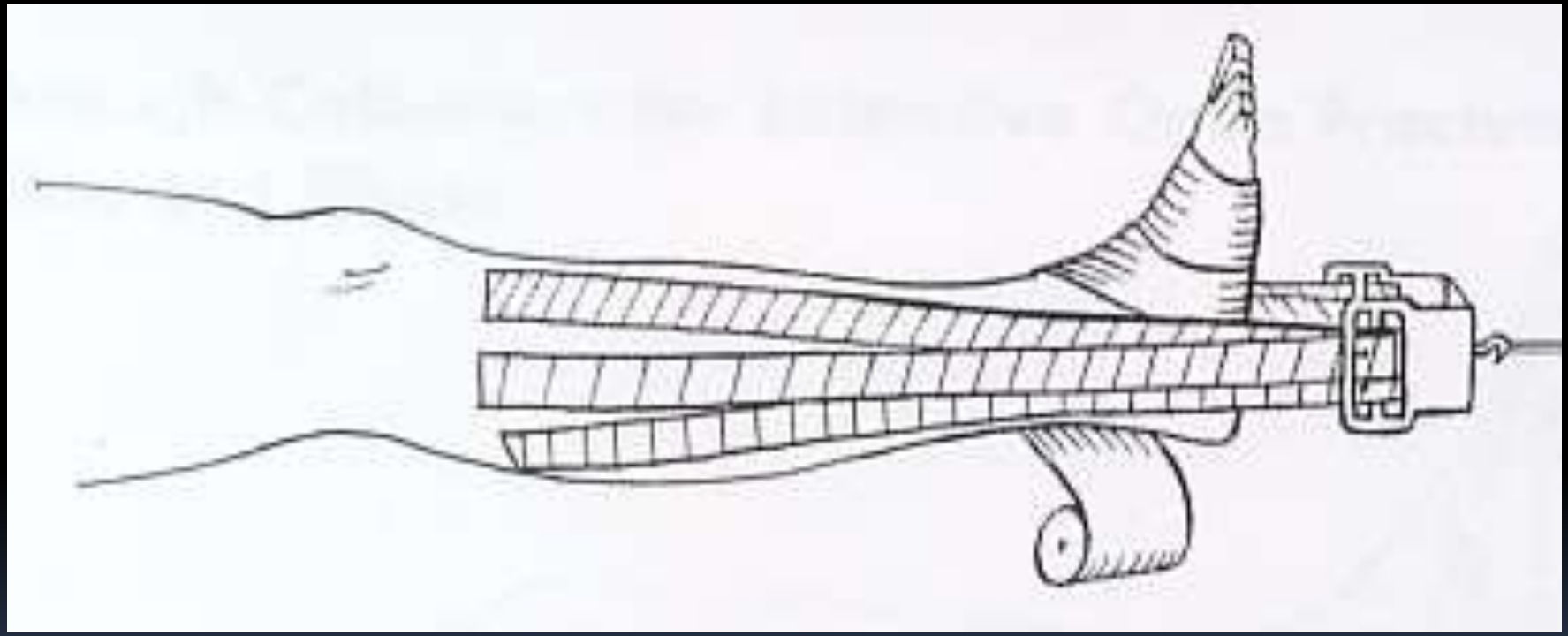




HIP Spicas



Skin traction



TRAKSI " ZERO " POSISI UNTUK FR.COLLUM HUMERI

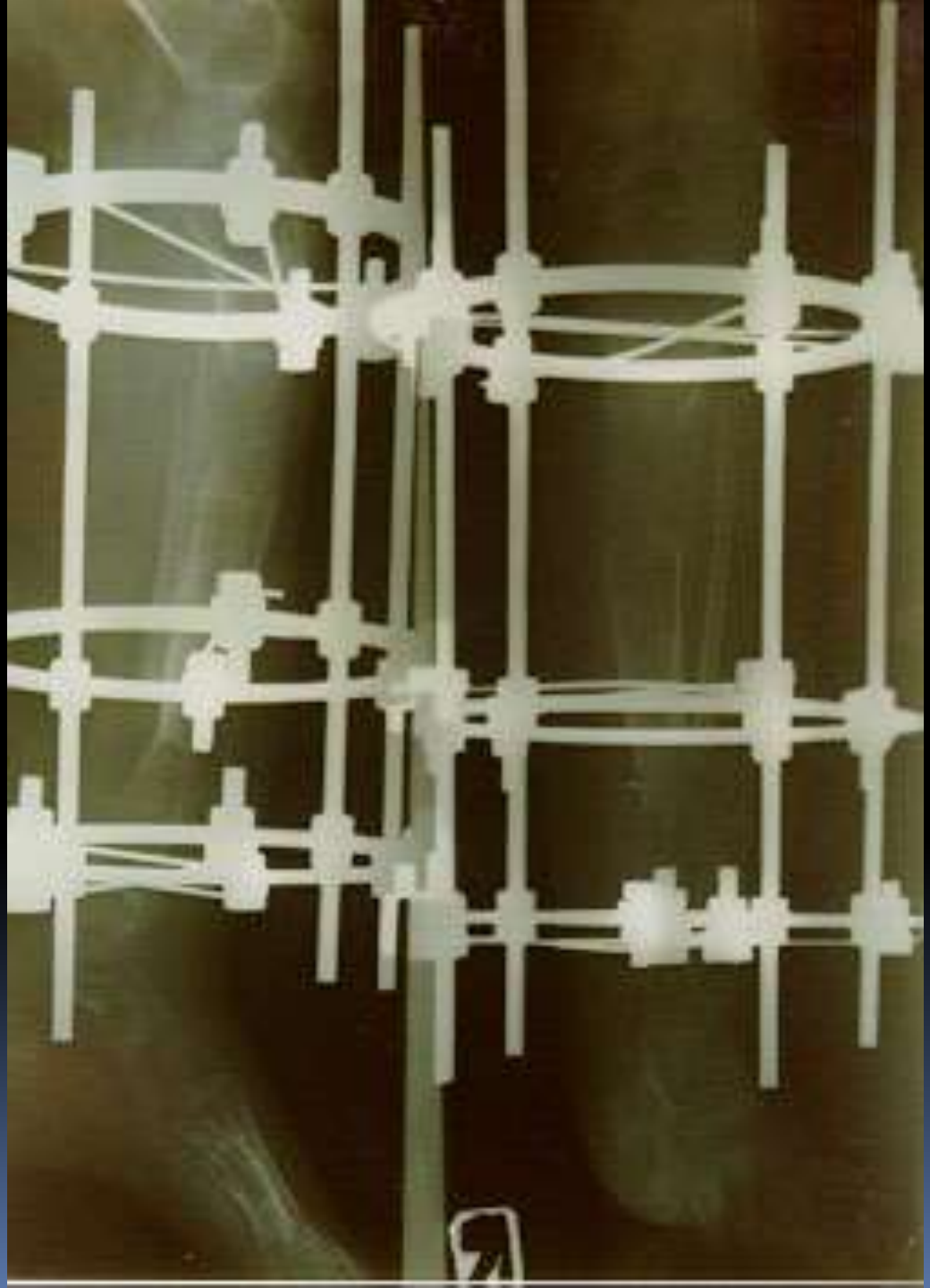
Keuntungan skin traksi

- Mudah dipakai, bisa dilakukan dimana saja, kapan saja dan siapa saja
- Tidak perlu fasilitas kamar operasi

Kerugian skin traksi

- Kulit harus utuh tidak ada luka dan tidak alergi terhadap adhesive plaster
- Beban terbatas $\leq$ 5kg
- Waktu $\geq$ 4 minggu

BOHLER BRAUN SKELETAL TRAKSI PADA FRAKTUR FEMUR



THANK YOU
FOR
YOUR ATTENTION